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Assessment of Vanaraja, Rainbow Rooster, and desi chicken birds under backyard poultry systems in South Garo Hills, Meghalaya

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Abstract

Meghalaya is a most popular hilly state for rural and tribal communities which are traditionally engaged in poultry rearing as a livelihood for centuries. In rural areas, desi chickens are commonly reared in backyard systems, but they characteristically have low efficiency in terms of egg and meat production. To enhance rural poultry farming and improve livelihoods, it is essential to promote the rearing of improved backyard poultry breeds that offer higher production while still being suited to local conditions. The present study was focused in order to evaluate production performances of three different types of chicken (Vanaraja, Rainbow Rooster and Desi birds). A total 120 nos. of tribal farmers were selected to assess different productive and reproductive traits for Desi, Vanaraja and Rainbow Rooster birds under field condition of Chokpot Block, South Garo Hills district, Meghalaya. The different parameters have been recording during the experiment i.e. mean body weight at various ages, age at first egg, egg production and egg weight at different stages and mortality rate. The results indicated that Vanaraja and Rainbow Rooster had significantly ($P \leq 0.01$) higher body weight than the Desi chicken. The mean age at first egg of 188.45±1.05 days and 188.45±1.05 days observed in Vanaraja and Rainbow Rooster, respectively were significantly ($P \leq 0.05$) lower than Desi bird (205.21±2.23days). The mean egg production and egg weight for Vanaraja and Rainbow Rooster were significantly ($P \leq 0.05$) higher than the desi birds. However, no significant differences were observed in mean egg production and egg weight between Vanaraja and Rainbow Rooster at similar ages. Significantly ($P \leq 0.05$) higher mortality rates were noticed in Vanaraja and Rainbow Rooster chicks, than the Desi chicks during 0-5 weeks of age. Therefore, the findings of this study indicated that the backyard poultry system with improved birds (Vanaraja and Rainbow Rooster) provides a better solution to Livelihood and nutritional security to the rural masses paving a way for sustainable livestock production in rural areas.

Keywords: Desi chickens, Egg production, Mortality, Rainbow Rooster, Vanaraja

Introduction

Poultry farming is the fastest growing meat sector of agriculture into the Indian rural areas. This sector plays significant role in current Indian economy and for doubling farmers' income. Natives of South Garo Hills, Meghalaya are mostly from rural and tribal community traditionally practices poultry farming for their own livelihood and nutritional security as well. Almost every household is still keeping 10-20 numbers of desi chickens at their available backyard places to meet their eggs and meat demands. However, native indigenous fowls are very dull in productivity due to their low inherent genetic potential. Thus, high yielding breeds of chicken like Vanaraja and Rainbow Rooster are successfully introduced in different states of the country andensuringexcellence chicken productionwith the minimum inputs and maintenance under backyard system of management. However, the systemic studies on the production and reproductive performance for Vanaraja and Rainbow Rooster birds under backyard poultry farming system in South Garo Hills district is very scanty and limited.Therefore, the present study has been emphasized to evaluate various economic traits for Vanaraja and Rainbow Rooster birds under backyard poultry farming in South Garo Hills district, Meghalaya.

Materials and Methods

The present study was conducted during April, 2019 to April, 2022 at Chokpot Block (South Garo Hills district, Meghalaya). A total of 120 progressive poultry farmers were selected based on their prior experience in poultry rearing. Each farmer maintained a backyard flock of approximately 100 to 150 birds. During the brooding period, chicks were provided with pre-starter broiler feed and clean drinking water. To ensure good health, all birds were vaccinated against Ranikhet disease following the standard vaccination schedule. After the brooding phase, the chicks were allowed to roam freely during the day and received supplemental feeding for 6-7 days to help them acclimatize to natural feed resources. To evaluate production efficiency of all three types of chicken varieties (Vanaraja, Rainbow Rooster and Desi birds) body weight (at 8, 16, 24, 32, 40 and 52 weeks of age), age at first egg, egg weight (at 32, 40 and 52 weeks of age), egg production (up to 32, 40 and 52 weeks of age) were recorded as per standard procedure and protocols. Mortality rate was recorded at 0 to 5, 6 to 30 and 31 to 52 weeks of age.All the data collected on various traits

were employed to standard statistical analysis as performed by Snedecor and Cochran (1994) [8].

Results and Discussion

The results of mean body weights for Vanaraja at 8, 16, 24, 32, 40 and 52 weeks of age were significantly (P≤0.05) higher than Rainbow Rooster and Desi chicken as shown in Table 1. Statisticallysignificant difference was noticed in the mean body weights between Vanaraja, Rainbow Rooster and Desi birds at similar ages. The Mean body weights of Vanaraja and Rainbow Rooster birds were significantly (P≤ 0.05) higher than Desi chicken that might be due to superior germplasm of Vanaraja and Rainbow Rooster. Similar trends were noticed in Vanaraja and indigenous chicken of backyard rearing system Sarma *et al.* (2018) [5].

Table 1: Productive performances for Vanaraja, Rainbow rooster and Desi chicken under backyard poultry farming

SL No.	Parameters	Vanaraja	Rainbow rooster	Desi
A	**Body weight (g) at**			
i	8th weeks	754.98±3.31^a	668.93±12.06^b	421.20± 14.18^c
ii	16th weeks	1245.37±30.82^a	1054.92±87.79^b	779.64±46.23^c
iii	24th weeks	1749.31±30.94^a	1447.17±29.78^b	948.71±27.61^c
iv	32th weeks	2195.18±62.41^a	1650.03±32.14^b	1248.42±31.29^c
v	40th weeks	2403.10±54.5^a	2011.03±57.01^b	1426.8±45.12^c
vi	52nd weeks	3250.08±29.51^a	2491.01±53.49^b	1980.98±24.12^c
B	Age at first egg (days)	188.45±1.05^a	189.77±2.03^a	205.21±2.23^b
C	**Egg production (nos.) up to**			
i	32 weeks	31.43±.012^a	31.33±0.15^a	22.67±0.06^b
ii	40 weeks	52.09±0.24^a	49.89±0.29^a	36.67±0.23^b
iii	52 weeks	86.33±1.34^a	84.23±0.96^a	45.54±0.74^b
D	**Egg weight(g) at**			
i	32 weeks	51.07±0.23^a	49.89±0.34^a	31.45±1.03^b
ii	40 weeks	52.89±0.56^a	51.65±0.03^a	32.73±0.53^b
iii	52 weeks	54.07±0.63^a	53.74±0.76^a	36.31±0.37^b
E	**Mortality (%)**			
i	0 to 5 weeks	13.02±1.35^a	14.89±1.02^a	9.31±0.64^b
ii	6 to 30 weeks	4.06±0.04^a	4.98±0.05^a	4.04±0.54^a
iii	31 to 52 weeks	1.03±0.23^a	1.32±0.46^a	1.23±0.04^a

The mean age at first egg observed in Vanaraja (188.45±1.05 days) and Rainbow Rooster (189.77±2.03 days) birds were significantly (P≤0.05) lower than Desi (205.21±2.23days) bird (Table 1) might be due to differences in the genetic component. These findings corroborated the study of Islam *et al.* (2014) [4] in case of Vanaraja and indigenous chicken. However, Deka *et al.* (2014) [3] found lower values of age at first egg than the present value in case of Vanaraja and Desi chicken under backyard system.

The mean egg production for Vanaraja and Rainbow Rooster birds were significantly (P≤0.05) higher than Desi chicken that probably because of differences in the genetic makeup of birds. However, no significant difference was observed in mean egg production between Vanaraja and Rainbow Rooster in similar ages. The present studies stronglysupported the similar findings in indigenous breed of chicken of Assam, Chutia (2010) [2]. In contrast to these findings, Niranjan *et al.* (2008) [6] reported lower egg production in Vanaraja chicken. The mean egg weight recorded for Vanaraja or Rainbow Rooster at 32, 40, 52 weeks were significantly (P≤0.05) higher than Desi chicken.However, no significant difference was observed in themean egg weights for both improved varieties (Vanaraja and Rainbow Rooster) as presented in Table 1. These findingssupported with the studies conducted in Vanaraja chicken, Niranjan *et al.* (2008) [6] and in another study of Vanaraja and indigenous chicken, Islam *et al.* (2014) [4].

In the case of Vanaraja and Rainbow Rooster chicks, significantly higher mortality rates ($P \leq 0.05$) were observed compared to Desi chicks during the early stages of life (0-5 weeks of age). This may be attributed to the natural brooding provided by the mother in Desi birds, as well as their greater hardiness. Mortality observed in the later stages of life was primarily due to predation across all groups, with no significant differences ($P \leq 0.05$) noted among the three chicken types (Table 1). Similar mortality rates, ranging from 0% to 15% under comparable rearing conditions, were also reported by Bhattacharya *et al.* (2005) [1] and Niranjan and Singh (2005) [7].

Conclusion

The present study concluded that the Vanaraja and Rainbow Rooster in terms of age at first egg laying, egg production and body weight performed better way compared to Desi birds into the backyard system of poultry rearing underagro-climatic condition of South Garo Hills, Meghalaya. Thus, it is recommended to the farmers forlarger scale farming of Vanaraja and Rainbow Rooster birds under backyard system of poultry for their livelihoods and nutritional security.

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